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# IMPLEMENTATION PLAN REVIEW FOR NEW MEXICO AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

TRW/Environmental Services

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# IMPLEMENTATION PLAN REVIEW FOR NEW MEXICO AS REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

U. S. ENVIRONMENTAL PROTECTION AGENCY

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EPA-450/3-74-075

# IMPLEMENTATION PLAN REVIEW
# FOR
# NEW MEXICO
# REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

PREPARED BY THE FOLLOWING TASK FORCE:

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Environmental Services of TRW, Inc.
(Contract 68-02-1385)

U. S. Environmental Protection Agency
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16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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NEW MEXICO

ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT
(SECTION IV - STATE IMPLEMENTATION PLAN REVIEW)

TABLE OF CONTENTS


| | Page |
|---|---|
| 1.0 EXECUTIVE SUMMARY | 1 |
| 2.0 STATE IMPLEMENTATION PLAN REVIEW | 6 |
| 2.1 Summary | 6 |
| 2.2 Air Quality Setting for the State of New Mexico. | 10 |
| 2.3 Background on the Development of the Current State Implementation Plan | 18 |
| 2.4 Special Considerations for the State of New Mexico | 19 |
| 3.0 AQCR ASSESSMENTS | 20 |
| 3.1 Regional Air Quality Assessments | 20 |
| 3.2 Power Plant Assessment | 23 |
| 3.3 Industrial/Commercial/Institutional Source Assessment | 25 |
| 3.4 Area Source Assessments. | 25 |
| BIBLIOGRAPHY | 26 |
| APPENDIX A | A-1 |
| APPENDIX B | B-1 |
| APPENDIX C | C-1 |
| APPENDIX D | D-1 |

# 1.0 EXECUTIVE SUMMARY

The enclosed report is the U. S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIPs, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the $SO_2$ emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have revised or are currently in the process of revising $SO_2$ regulations. These states are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are: 1) the use of the example region approach in developing Statewide air quality control strategies; 2) the existence of State Air Quality Standards which are more stringent than NAAQS; and 3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIPs were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCRs of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring one percent sulfur oil to be burned statewide where the use of a three percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based is the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality standards. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, $NO_x$, and HC emissions which occur in fuel switching, and other potential air pollution problems such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide ($SO_2$) emissions. This is because stationary fuel combustion sources often constitute the greatest source of $SO_2$ emissions and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the $SO_2$ and TSP emission tolerances within each of the various AQCRs. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants and industrial sources) has been carried out in Appendix C and D.
The following map of New Mexico shows the State's AQCRs. (Figure A-1).

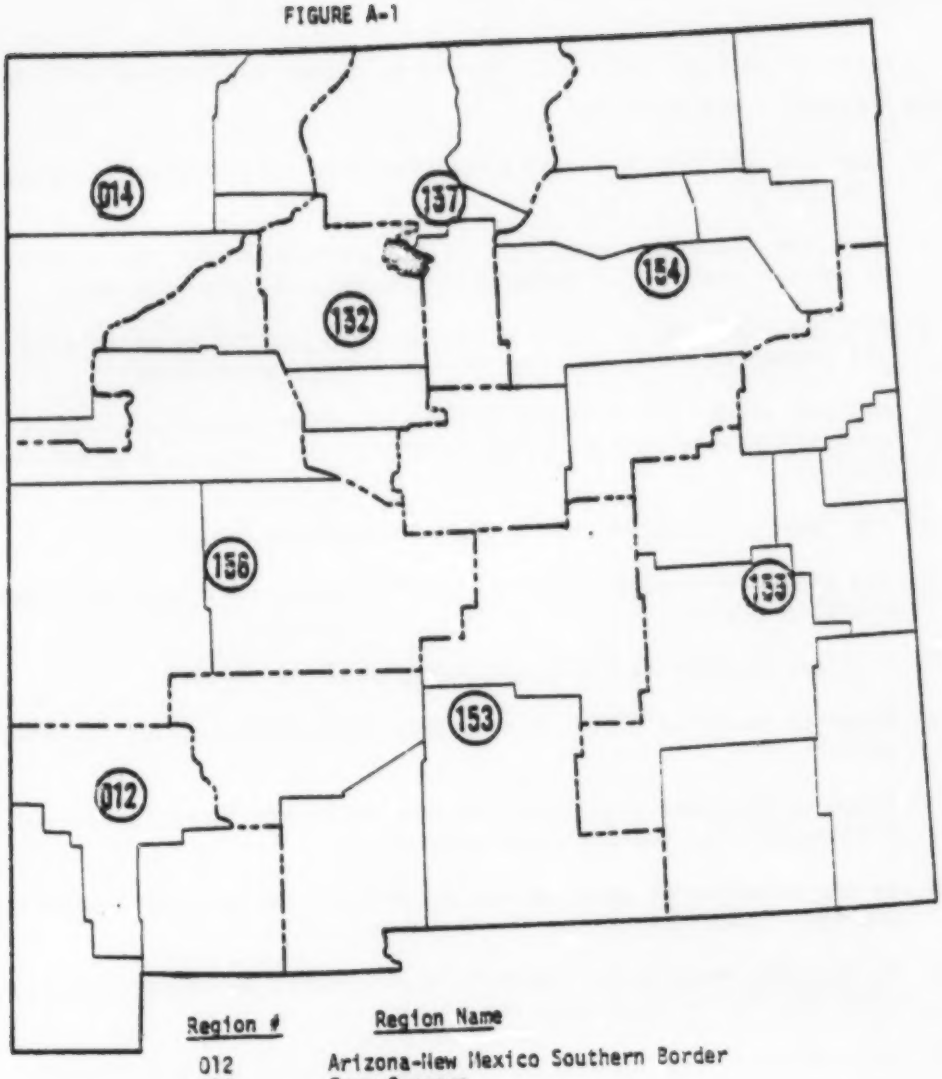
The major findings of the review are listed below:

- As required by Section IV of ESECA, the SIP for the State of New Mexico has been reviewed with particular attention to the most frequent causes of overly restrictive emission limiting regulations. There are a variety of State and Federal regulations that apply to stationary fuel combustion equipment in New Mexico. However, 1) none of these regulations apply to equipment using natural gas, 2) only one of the State's oil burning facilities has a heat input large enough to be subject to the emission regulation that applies to this type of equipment, 3) the regulation that applies to $SO_2$ emissions from the most sizeable of the State's stationary coal burning facilities does not require compliance until July 31, 1977, 4) based on information available, particulate emissions from New Mexico's coal burning facilities exceed the limits imposed by the State's particulate regulation, and 5) the State did not use the Example Region approach in developing its control strategy. In light of these facts, it does not appear that the regulations covering particulate and $SO_2$ emissions in the State are overly restrictive.

- Fugitive dust, (especially that from unpaved roads), is a significant contributor to NAAQS particulate violations in most of the State's AQCRs. Point sources, (namely power plants and smelters), account for most of the other air pollution problems in the State.

- The coal burning power plants in the New Mexico portion of the Four Corners AQCR account for more than half of the State's total hourly heat input at stationary fuel combustion facilities. Essentially all of the remaining heat input is provided with natural gas, while oil makes only a minor contribution.

FIGURE A-1




| Region # | Region Name |
|---|---|
| 012 | Arizona-New Mexico Southern Border |
| 014 | Four Corners |
| 152 | Albuquerque - Mid Rio Grande |
| 153 | El Paso-Las Cruces-Alamorgordo |
| 154 | Northeastern Plains |
| 155 | Pecos-Permian Basin |
| 156 | Southwest Mountains-Augustine Plains |
| 157 | Upper Rio Grande Valley |

## 2.0 STATE IMPLEMENTATION PLAN REVIEW

### 2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy.
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on reported (1973) Air Quality Data, does air quality meet NAAQS?
- Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?
- Is the fraction of total emissions from stationary fuel combustion sources higher than those of other sources?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?
- Must emission regulations be revised to accomplish significant fuel switching?
- Based on the above indicators, what is the potential for revising fuel combustion source emission limiting?
- Is there a significant clean fuels savings potential in the region?

This report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants and industrial sources) has been carried out in Appendix C and D.

Based on an overall evaluation of EPA's current information, AQCRs have been classified as good, marginal, or poor candidates for regulation revisions. The following table on page 8 summarizes the State Implementation Plan Review. The remaining portions of the report support this summary with explanations. The map of New Mexico on Page 5 shows the State's AQCRs and outlines the county boundaries (Figure A-1).

## STATE IMPLEMENTATION PLAN REVIEW - NEW MEXICO

### SUMMARY TABLE

| "INDICATORS" | STATE | | AQCR 012 | | AQCR 014 | | AQCR 152 | | AQCR 153 | | AQCR 154 | | AQCR 155 | | AQCR 156 | | AQCR 157 | | AQCR | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ |
| • Does the State have air quality standards which are more stringent than NAAQS? | No | No | | | | | | | | | | | | | | | | | | |
| • Does the State have emission limiting regulations for control of:<br>1. Power plants<br>2. Industrial sources<br>3. Area sources | Yes[1]<br>Yes[1]<br>No | Yes[1]<br>Yes[1]<br>No | | | | | | | | | | | | | | | | | | |
| • Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards? | No | No | | | | | | | | | | | | | | | | | | |
| • Has the State not initiated action to modify combustion source emission regulations [illegible] savings; i.e., under the Clean Fuels P[illegible] | Yes | Yes | | | | | | | | | | | | | | | | | | |
| • Are there no proposed Air Quality Maintenance Areas? | | | Yes | Yes | Yes | Yes | No | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | | |
| • Are there indications of a sufficient number of monitoring sites within a region? [2] | N/A | N/A | Yes | Yes | N/A[3] | N/A[3] | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | |
| • Is there an expected 1975 attainment date for NAAQS? | N/A | N/A | Yes | No | Yes | No | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | |
| • Based on reported (1973) Air Quality Data, does air quality meet NAAQS? | N/A | N/A | No | No | No | No[4] | No | Yes | No | Yes | No[5] | Yes | Yes | Yes | Yes | Yes | No[6] | Yes | | |
| • Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions? | N/A | N/A | No | No | No | No[7] | No | Yes | No | Yes | No | Yes | Yes | Yes | Yes | Yes | No | Yes | | |
| • Are the total emissions from stationary fuel combustion sources lower than those of other sources? | N/A | N/A | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | |
| • Do modeling results for specific fuel combustion sources show a potential for a regulation revision? | N/A | N/A | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | No | | |
| • Must emission regulations be revised to accomplish significant fuel switching? [8] | N/A | N/A | No | No | N/A[9] | N/A[9] | No | No | No | No | No | No | No | No | No | No | No | No | | |
| • Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations? [10] | N/A | N/A | Poor | Poor | Poor | Poor | Poor | Good | Poor | Good | Poor | Good | Good | Good | Good | Good | Poor | Good | | |
| • Is there a significant Clean Fuels Saving potential in the region? [11] | N/A | N/A | No | No | No | No | No | Yes[12] | No | Yes[13] | No | No[14] | Yes | Yes | No[15] | No[15] | No | No[15] | | |

Footnotes are on the following page.

1. The regulations for power plants and industrial sources exist, but most of the State's fuel combustion stationary sources are either exempt from direct control, or are not currently directly affected by the regulation because the compliance date is in 1977.

2. Considering the scope and nature of this review, most of the assessments made in response to this question would necessarily have to be largely subjective. These assessments would also be subject to varying degrees of error, partially because the sufficiency of a monitoring network depends not only on number, but also on location of the samplers with respect to major sources. In some New Mexico AQCRs, meteorology and topography have also been found to be important variables. The responses to this question should be viewed in light of these factors.

3. In this case, "N/A" denotes not answerable with available data. However, it appears that the State's monitoring network is not providing a representative picture of this AQCR's air quality.

4. This response is based on air quality values calculated using the NOAA diffusion model. The measured air quality data for this AQCR does not show TSP NAAQS violations.

5. One station violating the 24-hour secondary standard and one violating the 24-hour primary standard.

6. One station violating the 24-hour secondary standard.

7. This response is based on air quality values calculated using the NOAA diffusion model. The limited measured air quality data for this AQCR does not show $SO_2$ NAAQS violations.

8. The only fuel switch which has any practical importance here is a switch from gas to oil at a facility which has a dual fuel capability. The heat input level for most of the oil burning equipment in New Mexico was not high enough to make that equipment subject to the State's regulation. Thus a fuel switch could conceivably occur in which additional amounts of oil could be substituted for gas, but only to such a level that the applicable emission regulation does not take effect.

9. Since coal is already the major fuel used at stationary sources in this AQCR, and this coal is obtained from relatively nearby deposits, the potential for significant clean fuel savings is extremely limited. The only possibility for any such savings would be if the relatively low sulfur coal used in this AQCR was considered a 'clean fuel', and a high sulfur coal was used instead.

10. For this question, the "Poor" response is usually for those AQCRs in which NAAQS violations already occur. And though the currently applicable regulations are exerting little, if any, direct limitation on emissions from stationary fuel burning sources in that AQCR, it is felt that relaxation of these regulations may only aggravate the situation. A "Good" response indicates that the air quality in an AQCR is at such a level that additional emissions could be tolerated without causing NAAQS violations. With some sources, additional emissions could be achieved within the framework of existing applicable regulations. For example, using high sulfur oil in such a way that the average hourly heat input is less that 114.15 x $10^6$ BTU/hr, and therefore, not subject to emission regulations for oil burning equipment.

11. Responses to this question must consider a variety of factors. First, there must be a tolerance for emissions increase in the AQCR. Secondly, there has to be sources in the AQCR which have a capability to switch to fuels that would effect a clean fuel savings. The extent to which a facility has a dual fuel capability is not known with certainty in all cases. NEDS fuel schedules were used to provide information on this matter.

12. This AQCR has three power plants, each which burn both oil and gas.

13. This AQCR has only one power plant which burns both oil and gas.

14. The only major source in this AQCR is a coal burning power plant.

15. This AQCR has no major sources. This could possibly be a reason for its relatively clean air.

## 2.2 AIR QUALITY SETTING OF THE STATE OF NEW MEXICO

The state of New Mexico is divided into eight AQCRs. These are listed below:

012(7) Arizona-New Mexico Southern Border Interstate
014(1) Four Corners Interstate
152(2) Albuquerque-Mid Rio Grande Intrastate
153(6) El Paso-Las Cruces-Alamogordo Interstate
154(4) Northeastern Plains Intrastate
155(5) Pecos-Permian Basin Intrastate
156(8) Southwest Mountains-Augustine Plains Intrastate
157(3) Upper Rio Grande Valley Intrastate

The first number in the above listing are the numbers assigned to these regions by the U. S. Environmental Protection Agency (EPA) as part of a nationwide numbering system for AQCRs. The number in parentheses refers to a designation system used by the State of New Mexico to identify air quality control regions within its boundaries. Therefore while the numbers 012, 014 and 153 correspond to interstate AQCRs that span the boundaries of two to four states, the numbers 7, 1 and 6 correspond respectively to only the portions of these AQCRs that are within the State of New Mexico. For the intrastate AQCRs, the areas designated by the two numbering systems match. The numbering system developed by the State is used almost exclusively in the SIP.

Table A-1 and A-2 summarize additional general information that relates to the AQCRs in New Mexico. In Table A-1 the following is listed:

1) priority classifications for the pollutants under study
2) demographic information
3) counties within the State that have been designated Air Quality Maintenance Areas (AQMAs).

Priority classifications give a quick indication of the extent to which certain pollutants pose air quality problems for the AQCR. A Priority I listing indicates that relatively high ambient concentrations of the pollutant have

been observed, (or estimated, in the absence of air quality data), in the AQCR, while the Priority III designation reflects that the pollutant is generally present in concentrations below NAAQS. In those particular Priority I regions where the air quality reflects emissions predominantly from a single point source, the IA classification is used. As shown in Table A-1, two New Mexico AQCRs were classified Priority IA for both particulates and $SO_x$ (Arizona-New Mexico Southern Border (012) and Four Corners (014). Two additional AQCRs were classified Priority I for particulates (Albuquerque-Mid Rio Grande (152) and El Paso-Las Cruces-Alamogordo (153)). The latter of these two also had a Priority I classification for $SO_x$.

Table A-2 presents the dates at which the various ambient air quality standards are expected to be attained in each of the State's AQCRs. From this table it can be seen that some AQCRs have attainment dates beyond the July 1975 date which was originally prescribed for all states. This situation indicates that there is evidence (as assessed by either the state or EPA) of problems that will prevent NAAQS attainment within the time period initially prescribed by law.

A summary of the Federal and New Mexico ambient air quality standards for the pollutants under study is presented in Table A-3. Unlike the federal NAAQS example which stipulate both primary and secondary standards, New Mexico has only one set of standards. For TSP, these standards include the same values as the federal secondary standard plus two additional standards for seven and thirty day averaging periods. If the suspended particulates contain either beryllium, asbestos, or heavy metals, additional limitations will apply.

The 24-hour and annual secondary national standards that were in effect when New Mexico's SIP was being written were 60 and 260 $ug/m^3$, respectively. And although these standards have since been dropped from NAAQS, New Mexico's standards for $SO_2$ consit of the same values.

The SIP for New Mexico gives a rather comprehensive description of the AQCRs in the State; a description that includes demographic, meteorological and economic information, as well as discussions of general air quality. In general, the State's air quality and air pollution problems were described as being quite varied. The fact that all regions are classified either Priority I, IA, or III

reflects not only the variety of conditions, but also the extremes which are present. A total of 61% of State's land area, (which contains 41% of its population), is located in areas which are designated Priority III for all pollutants. Close to 35% of the land area, containing 25% of the State's population, is classified Priority I (or IA) for both particulates and $SO_2$. The remaining portions of the State's land area and population is located in an AQCR which has a Priority I classification for particulates, and is Priority III classification for $SO_2$.

With respect to the pollutants that are under study, the SIP indicates that four AQCRs were then experiencing air pollution problems of one sort or another. Two of these regions are classified Priority IA for both particulates and $SO_2$. Both of these involve interstate AQCRs, but the source responsible for the pollution is located in New Mexico in both cases. The first of these AQCRs is Arizona-New Mexico Southern Border AQCR (012). A copper smelter is the major $SO_2$ source in this AQCR, while the SIP indicates that dust from unpaved roads accounts for most of the particulate emissions. The second AQCR with problems is Four Corners (014). Within this region, which contains portions of four states (Arizona, Colorado, New Mexico and Utah), there are three major coal burning power plants. There are also plans for additional large coal burning facilities at other locations in the AQCR. Two of three current facilities are located in the New Mexico portion of the AQCR. One of these (the Four Corners Generating Station) has five units, while the other (the San Juan Power Plant) has recently put one unit (of a proposed two unit plant) into operation. These two facilities are less than 20 kilometers apart.

The third of the four problem regions in the State also involves an interstate AQCR. This is the New Mexico portion of the El Paso-Las Cruces-Alamogordo AQCR, and it is classified Priority I for both particulates and $SO_2$ (as well as for all other pollutants except $NO_2$). The SIP states that the basis for these classifications was air quality data and estimated emissions from within the El Paso, Texas metropolitan area, and that levels of $SO_2$ estimated for the New Mexico portions of this AQCR, (not near El Paso), are below Federal secondary standards. However, with respect to particulate matter, the SIP indicates that sizeable amounts are emitted as dust from unpaved roads in the New Mexico portions of the AQCR.

Albuquerque-Mid Rio Grande (152) is the last of the four New Mexico AQCRs experiencing air pollution problems. This region is classified Priority I for particulate, but Priority III for $SO_2$. An Emissions Inventory performed some time prior to the writing of the SIP attributes 84% of the particulate emissions to transportation activities. A total of 81% of these transportation associated emissions are due to dust from unpaved roads.

The SIP recognizes that dust from unpaved roads presents a vexing problem within the State. The magnitude of this problem for each region is shown in Table A-4 which lists the portion of an AQCRs particulate emission that is due to road dust. The most obvious solution to this problem, (i.e. paving the roads) was found to be too expensive for the State's limited budget. Two possible approaches to solving this problem were mentioned in the SIP. The first involved obtaining federal funds for an extensive road paving project, while the second consisted of proceeding with the State's current paving program as rapidly as possible. The SIP did not express a preference for either of these approaches, nor was any indication given of what the State plans to do to solve the dust from unpaved roads problem.

A summary of New Mexico's 1973 Air Quality Status is presented in Tables A-5 and A-6. As can be seen from this table, New Mexico's air monitoring network consists of 57 TSP sampler locations, 28 $SO_2$ bubbler locations, and 5 $SO_2$ continuous locations. For two of the interstate AQCRs, Arizona-N.M. So. Border and Four Corners the number of TSP monitors located in New Mexico is generally more than its equal share. (New Mexico has 71% of the stations in the first of these, a two state AQCR, and 35% of the stations in the four state Four Corners AQCR). The third interstate AQCR (El Paso-Las Cruces-Alamogordo) is shared with Texas, however, only 22% of the TSP monitors are within New Mexico's borders.

The manner in which $SO_2$ monitors are distributed between New Mexico and other states in interstate AQCRs follows the same general pattern as was described in each of the cases mentioned above (i.e. for the two AQCRs, New Mexico has more than its share, and for the third, most of the monitors are in Texas). One intrastate AQCR (S.W. Mtns.-Augustine Plains (156)) has no $SO_2$ monitoring stations. The fact that the TSP readings for this AQCR are some of the lowest in the State might lead one to expect that $SO_2$ levels would be correspondingly low.

The data presented in Tables A-5 and A-6 also shows (1) the various high and second high readings, (2) the number of stations exceeding ambient air quality standards, and (3) the % reduction of emissions required to meet these standards. This last item was based on applying the proportional model to the air quality data given. A negative rollback indicates the 1973 air quality measurements were below the Federal Secondary Standards, and that increases in emission could possibly take place without causing violations of these standards.

With the notable exception of the Four Corners AQCR(014), the TSP measurements in the regions generally reflect the priority designations for this pollutant. The highest TSP readings in the State occur in the El Paso-Las Cruces-Alamogordo AQCR(153), but data shows that even higher levels were recorded in Texas. Such a finding would be in line with the SIP conclusion that most of the emissions in this AQCR are due to sources in Texas. All high and second high TSP readings in the Arizona-New Mexico Southern Border Interstate AQCR (012) were recorded in New Mexico.

Due to a variety of reasons, the air quality setting in the Four Corners AQCR is somewhat more complex with respect to the pollutants under study. First the highest TSP measurement recorded for the New Mexico portion of this AQCR was below the secondary ambient standard. This is unexpected considering the massive emissions of the Four Corner's Generating Station, and the existence of other particulate sources in the New Mexico portion of the AQCR.

Secondly, a set of $SO_2$ readings provided by the SAROAD data bank have since been invalidated by EPA, Region VI. SAROAD reported listings of 4009 and 4008 $ug/m^3$, respectively, as the highest and second highest 24-hour measurements for the Four Corners AQCR (014) in 1973. Though these values had been obtained using the bubbler method of sample collection, a continuous monitor at the same location recorded 28 $ug/m^3$ as the 24-hour maximum for the year. In light of the two methods used, the two sets of values are incompatible. Further examination of the day-to-day record of bubbler data for this station was performed by EPA, Region VI. This examination uncovered a series of highly questionable readings. The 4009 and 4008 values were included in this series. Based on this finding, these readings were deemed

invalid. With the removal of these values, the highest remaining 24-hour $SO_2$ concentration recorded in the AQCR became 79 ug/$m^3$ (measured on a continuous monitor located in New Mexico).

Thirdly, a special set of circumstances has made it necessary to use air quality data derived from a diffusion model for the Four Corners AQCR, rather than to utilize SAROAD data. Thus the air quality values listed in Table A-6 for the Four Corners AQCR represent maximum $SO_2$ concentrations predicted to occur within the AQCR due to the simultaneous operation of the San Juan and Four Corners power plants (both located in New Mexico). The predictions were made using the diffusion modeling developed by the National Oceanic and Atmospheric Administration (NOAA) for the Southwest Energy Study. The model was originally used to make predictions of the location and magnitude of the maximum pollutant concentrations that would result from the operation of coal burning power plants that either currently exist, or are proposed for the Southwest.

The particular values shown in Table A-6 were obtained from EPA's Implementation Plan Evaluation Report for New Mexico's SIP. The information presented there is reproduced below:

Estimated Maximum Concentrations of Sulfur Oxides
Projected from 1977 Emission Levels

| Standard and Averaging Time | Predicted Concentration* (ug/$m^3$) | Distance from Four Corners Plant | Percent Control Required | |
|---|---|---|---|---|
| | | | Primary Standard | Secondary Standard |
| Annual Average | 38 | 50 Km. SW | 0% | 0% |
| 24-Hour | 2670 | 30 Km. NNE | 86% | - |
| 3-Hour | 13300 | 30 Km. NNE | - | 90% |

*Based on 20% control of Four Corners units 1, 2, 3 from planned wet scrubbers.

The "circumstances" that led to use of the model are 1) the relatively dense concentration of large coal burning power plants that are either now operating or proposed for the AQCR, 2) the area's topography and meteorology, and 3) extremely limited and inadequate air quality data for the region.

The lack of adequate $SO_2$ air quality data for the Four Corners AQCR seems to have been a long standing situation. The region's priority classification (made in November 1971) was based primarily on the level of emissions, expected from the power plants because measured air quality data was quite limited.

Reference to limited $SO_2$ data is also made in the State's SIP. In the section where the control strategies for the Four Corners AQCR are being evaluated, the statement is made, "The sulfur oxide and nitrogen oxide measurements are subject to some question since they were made only at two sites and over a fairly short time period." Though additional comments were made to lend credibility to these measurements, the statement does indicate the existence of limited data for this AQCR.

Although New Mexico's 7 bubbler and 4 continuous monitors (listed in Table A-6) are substantially more than the two used in the SIP's control strategy evaluation, it should be noted that a total of nine sites are actually being monitored, since two locations have both types of monitors.

A number of reasons can be identified as to why air quality data is limited for the Four Corners AQCR. Most of them revolve around the inability to place samplers at the locations where maximum concentrations are likely to occur. This is, in part, due to the terrain of these areas which is quite rugged, and to a large extent inaccessible. The out-of-the-way location of these sites also makes it difficult to provide the power needed to operate the samplers.

The meteorology and topography of the Four Corners AQCR also play a role. Their interaction with the emission plumes of the region's power plants tend to produce fumigation effects. That is, instead of emissions being mixed and dispersed in the air masses at stack height elevations, conditions are often such that a stream of only partially diluted pollutants turbulently descends to ground level. Furthermore, this fumigation effect acts in such a way that location of the place of highest concentration varies significantly from day to day. Thus

sampling could occur over a period of years prior to measuring these high concentrations.

Though much controversy has developed around the use of NOAA's diffusion model, it is not unusual for diffusion modeling to be used to predict air quality levels. The Code of Federal Regulations (CFR) clearly indicates that such models can be used for this purpose in the absence of air quality data (40 CFR Part 52). In fact, the Air Quality Display Model (AQDM) was used in the SIP to provide predictions of pollutant concentration for some of the AQCR's experienceing air pollution problems. And though these results were not used in the control strategy evaluation, they did serve to add credence to the low ambient $SO_2$ levels measured by the State's monitoring network.

However, unlike the NOAA model, the model used in the SIP did not take into account the area's topography. The consideration of a region's topographical variation is a requirement whenever diffusion modeling is used. The SIP model also failed to estimate short term $SO_2$ concentrations. Therefore, it could not determine whether the 3-hour $SO_2$ standard would be violated.

When the NOAA model was used, and topography and short term concentration levels were considered, the ambient $SO_2$ values that were calculated were much higher than those predicted by AQDM. This finding prompted EPA to require a greater degree of emission control at the Four Corners and San Juan power plants.

To a large extent, it is this requirement for greater control, (as based on the NOAA model) which is the cause of the controversy referred to above. The EPA has prescribed 70% control for the power plants in question, to be achieved with the use of alkaline scrubbers. The compliance date is July 31, 1977. The power companies concerned do not feel that 70% control is necessary, and therefore have contested this ruling. (See 39FR 10582 and 38FR 7551.) Two of the major points of contention in this controversy are: 1) The validity of assumptions incorporated in the model, 2) the insufficiency of air quality data available for correlating diffusion model predictions.

However, though realizing that there are drawbacks and uncertainties associated with using models, EPA's policy is that the result of the NOAA model are useful in that they indicate potential problem areas and the

approximate magnitude of ambient air quality concentrations. In the case of Four Corners, the substantially high concentrations that are predicted are sufficient to require application of best available control technology to the power plants in question. It is also EPA's position that the NOAA model has sufficiently sound technical basis to justify the requirement that a substantial control of emissions will be necessary for the attainment and maintenance of NAAQS in the Four Corners area.

## 2.3 BACKGROUND OF THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

The SIP stressed the fact that the different regions of the State had quite different air pollution problems. To deal with this situation, individual control strategies were designed to address the particular types of problems that were present in certain parts of the State. Thus the Example Region approach was not used in New Mexico.

The foundation of the control strategies consists of a series of State air pollution control regulations. And though they generally apply statewide, the regulations are written in such a manner that the desired control is directed towards specific problematic sources. In this way a regulation, which limits the amount of particulate material that can be emitted from stationary coal burning equipment, would obviously have most of its effect on the Four Corners power plant, which according to 1972 NEDS data, accounts for 99.4% of coal burned at the State's stationary sources.

Included in the SIP are evaluations of the regulations that have been developed to deal with the pollution problem in each of the Priority I or IA AQCRs. These evaluations were made using the emission and available air quality data in these regions. With respect to point source fuel combustion, New Mexico has essentially four regulations that relate to the control of $SO_2$ and particulate emissions. Two of the regulations apply to each of these emissions from coal burning equipment, while the other two cover oil burning equipment. There are no emissions limitations associated with the combustion of natural gas at stationary sources. These regulations are summarized in Table A-12.

The general conclusion of the SIP was that its evaluation of the control strategies demonstrated that the New Mexico Air Quality Control Regulations will be successful in meeting primary and secondary Federal ambient standards by 1975, except for the problems caused by dust from unpaved roads. In that little control could be exerted over the particulate emissions associated with unpaved roads, the SIP predicted that even fully implemented regulations would not prevent the allowable limits of emissions from being exceeded in two regions, (New Mexico portions of the Arizona-New Mexico Southern Border and of El Paso-Las Cruces-Alamogordo AQCRs). And the assumption is that when these limits are exceeded, violations of the ambient air quality standards (in these cases, both primary and secondary) will be the result.

## 2.4 SPECIAL CONSIDERATIONS

Three counties witnin New Mexico have been proposed as AQMAs, as shown in Table A-1. It is anticipated that special requirements for these areas will be developed, and ultimately result in modifications to the SIP.

The State of New Mexico is currently writing new regulations for particulates and $SO_2$ as a result of EPA's disapproval of control strategies for these two pollutants. In addition, the EPA is writing smelter regulations for the smelter operation at Hurley. New regulations may have a significant effect on the State's overall air quality, and therefore on the assessments of this report.

# 3.0 AQCR ASSESSMENTS

## 3.1 REGIONAL AIR QUALITY ASSESSMENT

Using the 1973 air quality data (Tables A-5 and A-6), as a basis, it is possible to identify AQCRs which are not plagued with relatively severe air pollution problems. As far as particulates are concerned, these AQCRs would include Pecos-Permian Basin (155), and Southwest Mountains-Augustine Plains (156). These are the only regions which have particulate air quality below the national secondary standards. And though the New Mexico portion of the Four Corners AQCR has measured TSP air quality cleaner than NAAQS, it is not included in this list because a region's candidacy is based on the acceptability of the entire AQCR. For $SO_2$, the list would include all AQCRs except Arizona-New Mexico Southern Borders (012), and Four Corners (014). The El Paso-Las Cruces-Alamogordo would be a marginal case in that its air quality is just slightly over the secondary standards, and according to the SIP, when Texas brings its smelter into compliance, most $SO_2$ emissions to the region will be curtailed.

Table A-7 presents a listing by AQCR of the number of power plants and other fuel combustion point sources that produce particulate and $SO_2$ emissions in New Mexico. The total given for each of the three interstate AQCRs applies only to the New Mexico portions of these AQCRs. Inclusion of both NEDS, and FPC data serves to not only note the existence of more than one source of information, but also points up data inconsistencies.

The most current data available was used to compile the $SO_2$ and particulate emissions data shown in Tables A-8 and A-9 respectively. These tables show that the bulk of $SO_2$ emissions (98%) are due to three AQCRs: (Arizona-New Mexico Southern Border, the smelter at Hurley being the main source; Four Corners, with its power generating units, and the Pecos-Permian Basin with a sulfuric acid plant and petroleum facilities that emit sulfur compounds.) In only one of these AQCRs, (Four Corners), is a sizeable percentage of these emissions due to point source fuel combustion. A similar situation holds for the particulate emissions as shown in Table A-9.

Tables A-10 and A-11 present the result when a proportional model is applied to 1973 air quality data to estimate the tolerance for emission increases. This display should be viewed in light of the limitations mentioned in Section 1.0. It should also be noted that the tolerance for $SO_2$ emissions for the Four Corners AQCR is based on calculated air quality resulting from the NOAA model.

The magnitude of a negative tolerance for emissions increase, (as shown in Table A-11) should not be used as a measure of an AQCR's relative standing in terms of tolerating more emissions. This magnitude is very much affected by the total emissions in the AQCR. Thus, the -4800 ton TSP tolerance for the New Mexico portion of the El Paso-Las Cruces-Alamogordo AQCR (153) does not reflect the fact that this region has higher ambient TSP levels than does the Albuquerque-Mid Rio Grande AQCR (which has a TSP tolerance of -13,300 tons).

The inclusion of information from the SIP (in Tables A-10 and A-11) is meant to summarize some of the State's air quality goals and objectives. In some instances particulate reductions are minimal even after full controls are in effect. This reflects some of the problems associated with areas where a sizeable proportion of the particulate emissions are due to dust from unpaved roads.

Tables B-1 and B-2 provide summaries of the general data that should be considered when estimating the potential for regulation relaxation. The overall regional evaluation on this chart is based on the tolerance for emission increase, and the other air quality indicators referred to in Section 2.1.

The conclusions that arise from the data presented in Tables B-1 and B-2 is that there are areas in New Mexico where the air is clean enough to tolerate additional emissions, and, based on the validity of the methodology used, presumably not violate air quality standards. Note that this does not mean that regulations can (or should) be relaxed. All that is being said is that the air is cleaner than federal standards say it has to be.

There could be any one of a myriad of reasons why the air in these regions is so clean. Over-restrictive regulations is only one possibility. However, though no definitive conclusions can be drawn at this time, other bits of

information tend to suggest that over-restrictiveness of the regulations is not the reason for the desirable air quality in the candidate regions.

The first bit of information regards the way the regulations themselves are written. Since there are no regulations for $SO_2$ and particulate emissions from gas burning equipment, it would appear that these combustion sources are in no way controlled.

It would also appear that there are no emission limits for oil burning equipment that has an average heat input of less than 114.15 million BTUs/hour. It is shown in Appendices C and D that only one of the State's stationary sources uses enough oil to satisfy this requirement. Thus, there are no emission limits for the remaining 6 stationary fuel combustion sources which use oil.

The result of these two situations is that the fuel combustion that produces approximately 51% of the State's BTUs from stationary sources (i.e. that due to oil and gas) is not affected by New Mexico's air pollution control regulations. (These fuel combustion processes include essentially all power plants = 11,525 million BTUs/hour and the other major industrial/commercial/ institutional point combustion sources = 604 million BTUs/hour. The San Juan plant was not included in this calculation.)

The remaining 49% is composed of the two major coal burning sources: the Four Corners Generating Station and a much smaller power plant with about 1/100th the heat input of the Four Corners plant.

New Mexico has regulations on the books that apply to the $SO_2$ and particulate emissions from the State's coal burning facilities. But the emission regulations that are currently applicable to the coal burning plants that produce essentially all of the emissions (namely the Four Corners and San Juan plants) have been promulgated by EPA. As previously noted, these regulations have a July 31, 1977 compliance date. Therefore, until this date the emissions from these sources are not subject to limitations.

Thus it would appear most of the State's fuel combustion takes place without the emissions being limited. There are no emission limiting regulations for gas burning equipment. The State's oil burning facilities do not have high enough hourly heat inputs to be covered by the emissinn regulations for this type of equipment. And though there are $SO_2$ emission

limiting regulations for New Mexico's coal burning power plants, the date for compliance to these regulations is in the future. In light of this situation, it cannot be concluded that the good air quality in those AQCRs that exhibit a tolerance for emissions increase is due to overly-restrictive regulations.

Based on the information presented in Tables B-1 and B-2, two AQCRs in New Mexico have a potential for accepting additional particulate emissions into their atmosphere, and five have a similar potential for accepting additional $SO_2$ emissions. The particulate candidates are the Pecos-Permian Basin (155) and Southwestern Augustine Plains (156) AQCRs. The $SO_2$ candidates are all of New Mexico's AQCRs, except Four Corners (014), Arizona-New Mexico Southern Border (012).

## 3.2 POWER PLANT ASSESSMENT

There are currently a total of thirteen power plants in New Mexico according to NEDS printout sheets. (NEDS rank order data shows a total of 18, while FPC data retrieval from the EPA shows 13. See Table A-7.) Pertinent combustion and emission data relating to thses plants (as obtained from the NEDS sheets) is presented in Table C-1.

The statistics for all other plants are dwarfed by those for the Four Corners plant. The high annual quantity of coal used (in tons), the high heat input and massive emissions dominate the power plant sector. This one plant accounts for more than one-half of the heat input for all of the State's power plants listed in the Appendices. Note that the heat input for the San Juan plant was not included in this assessment because the appropriate data was not available.

It should also be noted that the other much smaller coal burning power plant is generally much cleaner than the Four Corners plant, and though it violates New Mexico's existing and future particulate regulations, the $SO_2$ emission limits are met.

Outside of the Four Corners plant, most of the heat input for the State's power plants is provided with natural gas. Oil provides only about 2.4% of the heat input used for all of New Mexico's power plants. Though the total heat input contribution of oil is small for the power plants, six of the thirteen plants use oil in addition to gas. If a power plant which now uses only a small amount of oil, changes so that all of its required heat input would be provided by oil, then it may be subjected to the $SO_2$ and particulate emission regulations that apply for units with heat inputs greater than $114.15 \times 10^6$ BTU/hour. Based on their current use of oil, some installations would have difficulty in meeting these $SO_2$ regulations depending on whether their equipment is classified as new or existing. It is expected that all facilities would have difficulty with the 0.005 lbs/$10^6$ BTU particulate limit.

Six of New Mexico's 13 power plants are currently using oil, in addition to their major fuel, natural gas. The total heat input of all fuels to these six plants is $3873 \times 10^6$ BTU/hour (33.6% of the total heat input to power plants). Therefore, assuming that the combustion equipment at these plants is technically able to use oil to supply the plant's total heat input requirements, then these plants represent potential and flexibility for fuel switching. But based on the emission data presented in Table C-1, it would appear that such plants could not meet the emission limitation that would be imposed on them once their heat input passed the $114.15 \times 10^6$ BTU/hour mark.

It should be noted that 14% of the total heat input used in New Mexico's power plants, is associated with plants located in the Pecos-Permian Basin AQCR (155), a candidate area. Two of these plants use oil in addition to natural gas.

This analysis does not take into account that the San Juan power plant (a coal burner) has recently gone on line in New Mexico. Emissions from this plant may have some impact on air quality, especially in the Four Corners AQCR where it is located.

## 3.3 INDUSTRIAL/COMMERCIAL/INSTITUTIONAL SOURCE ASSESSMENT

Table D-1 presents the pertinent fuel combustion data for point sources in the industrial sector. Of the five sources listed, only one uses oil in addition to natural gas. The remaining ones use gas exclusively.

It is not known to what extent a fuel switch or the relaxation of regulations can take place in these facilities, but it should be noted that a total switch from gas to oil in the one industrial facility that burns oil would result in the $SO_2$ and particulate emission regulations for oil burning equipment to take effect (once a heat input of 114.15 million BTU/hour is reached).

## 3.4 AREA SOURCE ASSESSMENTS

There were no area sources in New Mexico which could be evaluated within the context of Section IV of ESECA.

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(3) "Monitoring and Air Quality Trends Report, 1972," U.S. EPA-450/1-73-004.

(4) "Steam-Electric Plant Factors/1072," 22nd Edition National Coal Association.

(5) "Federal Air Quality Control Regions," U.S. EPA, Pub. No. AP-102.

(6) "Assessment of the Impact of Air Quality Requirements on Coal in 1975, 1977 and 1980," U.S. Department of the Interior, Bureau of Mines, January 1974.

(7) "Fuel and Energy Data," U.S. Department of Interior Bureau of Mines, Government Printing Office, 1974, 0-550-211.

(8) "Compilation of Air Pollutant Emission Factors, 2nd Edition," U.S. EPA, Air Pollution Tech., Pub. AP-42, April 1973.

(9) SAROAD Data Bank, 1973 Information, U.S. EPA.

(10) Federal Power Commission, U.S. Power Plant Statistics Stored in EPA Data Bank, September 1974.

(11) State of New Mexico Implementation Plan, submitted January 27, 1972 by Governor Bruce King.

# APPENDIX A

- State implementation plan information
- Current air quality information
- Current emissions information

Tables in this appendix summarize original and modified state implementation plan information, including original priority classifications, attainment dates, ambient air quality standards, and fuel combustion emission regulations. SAROAD data for $SO_2$ and TSP monitoring stations are shown for AQCRs in the State. NEDS emissions data by AQCR[1] are tabulated and broken down into fuel burning categories.

Tables A-10 and A-11 show a comparison of emission inventories in the original SIP and those from the NEDS. An emission tolerance, or emission tonnage which might be allowed in the AQCR and still not violate national secondary ambient air quality standards, is shown for $SO_2$ and particulates. The intent of this calculation is to indicate possible candidate regions for fuel switching. Tolerance was based on either the degree of control expected by the SIP or upon air quality/emission relationships which are calculated from more recent data. The value of the emission tolerance provides an indication of the degree of potential an AQCR possesses for fuel revisions and regulation relaxation.

Methodology for Increased Emissions Tolerance

A tolerance for increased emissions was determined as follows: The "allowable emissions" were calculated for each AQCR based on 1972 NEDS data and the percent reduction (or increase) required to meet the national secondary ambient air quality standards in that AQCR (worst case from Tables A-5 and A-6).

The percentages used in this calculation were obtained via the use of current 1973 air quality data and the proportional rollback model. The values for background TSP concentrations were the same as those used in the SIP. This background value was used in all calculations involving the annual standard, but a zero TSP background was assumed for the calculation of reductions based on the 24-hour standard. (This was done because background levels are, in effect, an annual average, and therefore, should be

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[1] "1972 National Emissions Report," EPA - 450/2-74-012, June 1974.

compared with only annual data. It is reasonable to expect that the "real background" for any particular 24-hour period to be different for other 24-hour periods.)

The NEDS emissions are subtracted from the "allowables" to determine the tolerance for emissions increase. A positive value for this result indicates a potential for increasing emissions.

When the current air quality levels were less than one-half of the level represented by an ambient air quality standard, no "rollup" emissions tolerance was calculated in Tables A-10 and A-11. This arbitrary cutoff point was chosen so as not to distort the emissions tolerance for an area. At low levels of a pollutant, the relationship between emissions and air quality is probably not linear. Although this cutoff may leave some AQCRs with no quantifiable emissions tolerance, it was felt that no number at all would be preferable to a bad or misleading number.

It is emphasized that emissions tolerance is a region-wide calculation. This tolerance obviously makes more sense in, say, an urban AQCR with many closely spaced emissions sources than in a largely rural AQCR with geographically dispursed emissions.

A word of caution regarding particulates needs mentioning. Emission source estimates in the NEDS data bank and most state SIP's are for total particulates. Generally, the control strategies for particulates are aimed at total particulates, while the high-volume particulate sampling (SAROAD data) measures only the finer, suspended fraction. A given level of total particulate emissions control will therefore not translate into the same level of measured ambient air quality. Some of the larger particulates being controlled will not remain suspended, and therefore would not be measured by the High-volume technique. Hence, particulate control plans may have underestimated the amount of control necessary to achieve ambient air quality standards.

# Table A-1. AQCR Priority Classification and AQMAs

| AQCR | Fed. # | Part.[a] | $SO_x$[b] | $NO_x$[c] | Demographic Information[e] Population 1970 | Square Miles | Population Density | AQMA Designations[d] TSP Counties | $SO_x$ Counties | $NO_x$ Counties |
|---|---|---|---|---|---|---|---|---|---|---|
| Ariz. N.Mex. So. Border | 012 | IA | IA | III | 38,470 | 10,374 | 3.7 | None | None[g] | None[h] |
| Four Corners | 014 | IA | IA | III | 90,000 | 12,500 | 7.2 | None | None[g] | None |
| Albuquerque-Mid Rio Grande | 152 | I | III | III | 353,000 | 5,000 | 70.6[f] | Bernalillo | None | None |
| El Paso-Las Crues-Alamogordo | 153 | I | I | III | 125,619 | 18,335 | 6.8 | Dona Ana | None | None |
| Northeastern Plains | 154 | III | III | III | 54,738 | 22,747 | 2.1 | None | None | None |
| Pecos-Permian Basin | 155 | III | III | III | 233,648 | 23,749 | 9.8 | None | None | None |
| Southwest Mts.-Augustine Plains | 156 | III | III | III | 40,880 | 20,256 | 2.0 | None | None | None |
| Upper Rio Grande Valley | 157 | III | III | III | 93,738 | 6,136 | 13.3 | Santa Fe | None | None |

| Priority | I Greater than | II From-to | III Less than |
|---|---|---|---|
| [a]Sulfur oxide: | | | |
| Annual arithmetic mean.. | 100 | 60-100 | 60 |
| 24-hour maximum ..... | 455 | 260-455 | 260 |
| [b]Particulate matter: | | | |
| Annual geometric mean .. | 95 | 60- 95 | 60 |
| 24-hour maximum ..... | 325 | 150-325 | 150 |
| [c]Nitrogen dioxide | 110 | | 110 |

[d]As indicated in the Proposed Air Quality Maintenance Designations for New Mexico: Background and Rationale, EPA, Region VI

[e]Information obtained from SIP

[f]Average for the entire region, but the two counties that comprise this region vary widely in population density. One county (Sandoval) is sparsely populated, while Bernalillo County has 271.5 people per square mile.

[g]Grant and San Juan counties in AQCRs 012 and 014, respectively, had originally been proposed as $SO_x$ AQMAs. However, recent information (November 1974) from EPA-Region VI indicates that their current thinking favors dropping these proposed designations.

[h]For New Mexico portion of AQCR only.

Table A-2. New Mexico Attainment Dates[b]

| AQCR # | Name | Particulates Attainment Dates | | Sulfur Dioxide Attainment Dates | | Nitrogen Oxides Attainment Dates |
|---|---|---|---|---|---|---|
| | | Primary | Secondary | Primary | Secondary | |
| 012 | Arizona-New Mexico Southern Border | 7/75 | 7/75 | 7/75 | c | a |
| 014 | Four Corners | a | 7/75 | 7/77[d] | 7/77[d] | a |
| 152 | Albuquerque - Mid Rio Grande | 7/75 | 7/75 | a | a | a |
| 153 | El Paso-Las Cruces-Alamogordo | 7/75 | 7/77 | 7/75 | 7/75 | a |
| 154 | Northeastern Plains | a | a | a | a | a |
| 155 | Pecos-Permian Basin | a | a | a | a | a |
| 156 | Southwest Mountains - Augustin Plains | a | a | a | a | a |
| 157 | Upper Rio Grande Valley | a | a | a | a | a |

a) ambient air quality levels did not exceed NAAQS at time attainment dates were formalized

b) based on information supplied by EPA - Durham

c) 18 month extension granted for submittal of plan.

d) these were originally given as 3/76, but subsequent extensions have been made to the 7/77 date (see 39 FR 10582, March 21, 1974).

Table A-3. Ambient Air Quality Standards, New Mexico

(all concentrations in $\mu g/m^3$)

| | | Total Suspended Particulate | | Sulfur Oxides | | | | Nitrogen Dioxide |
|---|---|---|---|---|---|---|---|---|
| | | Annual | 24 hr. | Annual | 24 hr. | 3 hr. | 1 hr. | |
| Federal (Nov. 1972) | Primary | 75 (G) | 260[a] | 80(A) | 365[a] | -- | | 100(A) |
| | Secondary | 60 (G) | 150[a] | -- | -- | 1300[a] | | 100(A) |
| State[b] | | 60 (G) | 150 | 60(A)* | 260[a]* | -- | | 100(A) |



(A) = Annual arithmetic mean

(G) = Annual geometric mean

[a]Not to be exceeded more than once per year

[b]New Mexico also has two additional standards for TSP: 7 day average = 110 $\mu g/m^3$ maximum
30 day average = 90 $\mu g/m^3$ maximum

*New Mexico's ambient air quality standard for $SO_2$ (contained in the State's Air Quality Control Regulation Number 201), is stated in terms of parts per million (ppm). The values given were 0.02 and 0.1 ppm respectively. The values listed in this table (in units of $ug/m^3$) were obtained via use of the generally accepted conversions contained in Section 51.3 of 36 FR 22398.

Table A-4. Regional Particulate Emissions Derived from Unpaved Roads[a]

| AQCR[b] | Name | Percent of Particulate Emissions Derived from Unpaved Roads |
|---|---|---|
| 012 | Arizona-New Mexico Southern Border | 78% |
| 014 | Four Corners | 21% |
| 152 | Albuquerque - Mid Rio grande | 81% |
| 153 | El Paso - Las Cruces - Alamogordo | 94% |
| 154 | Northeastern Plains | 82% |
| 155 | Pecos - Permian Basin | 68% |
| 156 | Southwest Mountains - Augustin Plains | 95% |
| 157 | Upper Rio Grande Valley | 46% |

[a] Obtained from New Mexico SIP.
[b] For interstate AQCRs, percent figure applies only to the New Mexico portion of that AQCR.
[c] Information obtained from New Mexico SIP.

Table A-5. New Mexico AQCR Air Quality Status, TSP[a]

| AQCR Name | AQCR # | # Stations Reporting | TSP Concentration ($\mu g/m^3$) Highest Reading Annual | Highest Reading 24-Hr | 2nd Highest Reading 24-Hr | # Stations Exceeding Ambient Air Quality Standards Primary Annual | Primary 24-Hr[c] | Secondary Annual | Secondary % | Secondary 24-Hr[c] | Secondary % | % Reduction[d] Required to Meet Standards | Standard on Which % Reduction Is Based |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arizona-New Mexico | 012[b] | 14 | 72 | 523 | 395 | 0 | 2 | 1 | 7 | 8 | 57 | 62 | 24-hr |
| Southern Border | (New Mex.) | 10 | 72 | 523 | 395 | 0 | 2 | 1 | 10 | 6 | 60 | 62 | 24-hr |
| Four Corners | 014[b] | 23 | 65 | 430[e] | 375[e] | 0 | 1 | 1[f] | 4 | 5 | 22 | 60 | 24-hr |
| | (New Mex.) | 6 | - | 116 | 94 | - | 0 | - | - | 0 | 0 | -60 | 24-hr |
| Albuquerque-Mid Rio Grande | 152 | 12 | 95 | 362 | 314 | 3 | 2 | 5 | 42 | 6 | 50 | 52 | 24-hr |
| El Paso-Las Cruces | 153[b] | 32 | 190 | 907[g] | 713[g] | 16 | 11 | 20 | 62 | 23 | 72 | 79 | 24-hr |
| Alamogordo | (New Mex.) | 7 | 104 | 759 | 463 | 2 | 1 | 3 | 43 | 3 | 43 | 68 | 24-hr |
| Northeastern Plains | 154 | 2 | - | 179 | 170 | 0 | 0 | 0 | 0 | 1 | 50 | 12 | 24-hr |
| Pecos-Permian Basin | 155 | 6 | - | 282 | 102 | 0 | 0 | 0 | 0 | 0 | 0 | -47 | 24-hr |
| S.W. Mountains Augustine Plains | 156 | 1 | 32 | 185 | 114 | 0 | 0 | 0 | 0 | 0 | 0 | -32 | 24-hr |
| Upper Rio Grande Valley | 157 | 9 | 43 | 337 | 278 | 0 | 1 | 0 | 0 | 1 | 11 | 46 | 24-hr |

[a] 1973 air quality data is National Air Data Bank as of June 7, 1974.

[b] Interstate

[c] Violations based on 2nd highest reading at any station

[d] Formula $\left[\left(\frac{\text{2nd Highest 24 hr - 24 hr Secondary Standard}}{\text{2nd Highest 24 Hr - Background}}\right) \times 100, \left(\frac{\text{Annual - Annual Secondard Standard}}{\text{Annual - Background}}\right)\right]$

background = 17 $\mu g/m^3$

[e] recorded in Arizona

[f] recorded in Colorado

[g] recorded in Texas

## Table A-6. New Mexico AQCR Air Quality Status (1973), $SO_2$[a]

| AQCR Name | AQCR # | # Stations Reporting 24-Hr (Bubbler) | # Stations Reporting (Contin.) | $SO_2$ Concentration ($\mu g/m^3$) Highest Reading Annual | Highest Reading 24-Hr | 2nd Highest Reading 24-Hr | # Stations Exceeding Ambient Air Quality Stds. Primary Annual | Primary 24-Hr[c] | Secondary 3-Hr | % Reduction[d] Required To Meet Standards | Standard on Which % Reduction Is Based |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Arizona - New Mex. Southern Border | 012[b] | 17 | 9 | 137 | 3510 | 1394 | 2[h] | 9[i] | 8 | 74 | 24 Hr |
| | (N.M) | 10 | 2 | 137 | 1294 | 1031 | 1 | 3[j] | 2 | 65 | 24 Hr |
| 2. Four Corners | 014[b] | 9 | 4 | 38[g] | 2670[g] | - | 0 | 0 | 0 | 90[f] | 3 Hr |
| | (N.M) | 7 | 4 | 38[g] | 79 | - | 0 | 0 | 0 | 90[f] | 3 Hr |
| 3. Albuquerque - Mid Rio Grande | 152 | 1 | - | - | 16 | 9 | 0 | 0 | - | e | - |
| 4. El Paso - Las Cruces - Alamogordo | 153[b] | 12 | 1 | 62 | 390 | 285 | 0 | 0 | 0 | 28 | 24 Hr |
| | (N.M) | 5 | - | 62 | 390 | 285 | 0 | 0 | - | 28 | 24 Hr |
| 5. Northeastern Plain | 154 | 1 | - | - | 18 | 7 | 0 | 0 | - | e | - |
| 6. Pecos - Permian Basin | 155 | 2 | - | - | 5 | 2 | 0 | 0 | - | e | - |
| 7. S.W.Mountains Augustina Plains | 156 | - | - | - | - | - | - | - | - | - | - |
| 8. Upper Rio Grande Valley | 157 | 2 | - | - | 2 | 2 | 0 | 0 | - | e | - |

[a] 1973 air quality data is National Air Data Bank as of June 7, 1974

[b] Interstate.

[c] Violations based on 2nd highest reading at any station.

For calculations
Annual Std = 80
24-hour Std = 365

[d] Formula [ $\left(\frac{\text{2nd Highest 24 Hr - 24 Hr Standard}}{\text{2nd Highest 24 Hr}}\right) \times 100$, $\left(\frac{\text{Annual - Annual Standard}}{\text{Annual}}\right) \times 100$ ]

[e] The most adverse air quality reading for this AQCR is less than 1/2 the secondary standard, therefore % reductions were not calculated in order to not mislead the reader with unrealistic percentages.
$SO_2$ - background is assumed to be zero.

[f] This is based on a model estimated 3 hr $SO_2$ maximum of 13,300 $mg/m^3$. The 24-hr value shown on this table would correspond to an 86% reduction using the proportional rollback model.

[g] Based on modeling results for New Mexico portion of AQCR.

[h] Is 1 + 1. (i.e., one bubbler station exceeded standards and one continuous station exceeded standards.

[i] Is sum of six continuous and three bubbler violations; two of the three bubbler violations occurred at the same station where two of the six continuous violations were recorded. Thus only a total of seven locations in the AQCR exhibit 24-hour violations.

[j] Is a sum of two continuous and one bubbler violations; the one bubbler violation occurred at the same station where one of the two continuous violations are recorded. Thus only a total of two locations in N.M. exhibit 24-hour violations.

Table A-7. New Mexico Fuel Combustion Source Summary[b]

| AQCR | AQCR # | New Mexico Power Plants NEDS[b] | New Mexico Power Plants FPC[c] | Other Fuel Combustion Point Sources[a] Particulate | Other Fuel Combustion Point Sources[a] $SO_2$ |
|---|---|---|---|---|---|
| Arizona - New Mexico Southern Borders[a] | 012 | 1 | 1 | 6 | 2 |
| Four Corners[a] | 014 | 2 | 2 | 19 | 1 |
| Albuquerque - Mid Rio Grande | 152 | 3 | 4 | 1 | 0 |
| El Paso - Las Cruces - Alamogordo[a] | 153 | 1 | 1 | 3 | 0 |
| Northeastern Plains | 154 | 2 | 0 | 2 | 1 |
| Pecos - Permian Basin | 155 | 8 | 5 | 42 | 11 |
| Southwestern Mountains - Augustine Plains | 156 | 0 | 0 | 6 | 1 |
| Upper Rio Grande Valley | 157 | 1 | 0 | 2 | 1 |

[a] Interstate

[b] From NEDS data in data bank as of June 1974.

[c] FPC data retrieved from EPA data banks.

Table A-8. New Mexico Emission Summary, $SO_2$[a]

| AQCR | Total $10^3$ Tons/Year | Percent from Fuel Combustion | Electricity Generation $10^3$ Tons/Year | Electricity Generation % | Point Source Fuel Combustion $10^3$ Tons/Year | Point Source Fuel Combustion % | Area Source Fuel Combustion $10^3$ Tons/Year | Area Source Fuel Combustion % |
|---|---|---|---|---|---|---|---|---|
| Arizona,- New Mexico Southern Borders[b] | | | | | | | | |
| (a) New Mexico | 247.0 | 0.04 | 0 | 0 | 0.072 | 0.03 | .024 | 0.01 |
| (b) Other states | 947.0 | 0.03 | 0 | 0 | 0.21 | 0.02 | .07 | 0.01 |
| Four Corners[b] | | | | | | | | |
| (a) New Mexico | 113.0 | 95.2 | 107.4 | 95.0 | 0.17 | 0.2 | .03 | 0.03 |
| (b) Other states | 6.4 | 68.0 | 3.1 | 48.0 | 0 | 0 | 1.28 | 20.0 |
| Albuquerque - Mid Rio Grande | 4.8 | 24.0 | 0.93 | 19.4 | 0 | 0 | 0.22 | 4.6 |
| El Paso - Las Cruces - Alamogordo[b] | | | | | | | | |
| (a) New Mexico | 1.2 | 35.7 | 0.35 | 29.0 | 0 | 0 | 0.08 | 6.7 |
| (b) Other states | 178.8 | 1.7 | 1.15 | 0.6 | 0.4 | 0.2 | 1.52 | 0.9 |
| Northeastern Plains | 0.83 | 22.9 | 0.14 | 16.9 | 0 | 0 | 0.05 | 6.0 |
| Peco - Permian Basin | 119.0 | 6.3 | 0.11 | 0.09 | 7.2 | 6.1 | 0.12 | 0.1 |
| Southwest Mountains - Augustine Plains | 2.7 | 2.2 | 0 | 0 | 0 | 0 | 0.06 | 2.2 |
| Upper Rio Grande Valley | 0.67 | 91.0 | 0 | 0 | 0 | 0 | 0.06 | 9.0 |
| TOTAL | 1,621.4 | | | | | | | |
| Total (New Mexico only) | 489.2 | | | | | | | |

[a]Emissions in data bank as of June 27, 1974.

[b]Interstate.

Table A-9. New Mexico Emission Summary, Particulates[a]

| AQCR | Total $10^3$ Tons/Year | Percent from Fuel Combustion | Electricity Generation $10^3$ Tons/Year | Electricity Generation % | Point Source Fuel Combustion $10^3$ Tons/Year | Point Source Fuel Combustion % | Area Source Fuel Combustion $10^3$ Tons/Year | Area Source Fuel Combustion % |
|---|---|---|---|---|---|---|---|---|
| Arizona - New Mexico Southern Borders[b] | | | | | | | | |
| (a) New Mexico portion | 3.4 | 2.7 | .017 | 0.5 | 0.03 | 0.9 | 0.043 | 1.3 |
| (b) Other states | 19.9 | 0.7 | .023 | 0.1 | 0.06 | 0.3 | 0.057 | 0.3 |
| Four Corners[b] | | | | | | | | |
| (a) New Mexico portion | 24.6 | 83.6 | 20.3 | 82.5 | .067 | 0.3 | 0.2 | 0.8 |
| (b) Other states | 13.1 | 71.3 | 7.1 | 54.2 | .033 | 0.3 | 2.2 | 16.8 |
| Albuquerque - Mid Rio Grande | 25.6 | 2.9 | 0.17 | 0.66 | 0 | 0 | 0.57 | 2.2 |
| El Paso - Las Cruces - Alamogordo[b] | | | | | | | | |
| (a) New Mexico portion | 7.0 | 3.2 | 0.09 | 1.3 | 0 | 0 | 0.13 | 1.9 |
| (b) Other states | 7.2 | 3.8 | 0.14 | 1.9 | 0 | 0 | 0.14 | 1.9 |
| Northeastern Plains | 11.5 | 4.9 | 0.23 | 2.0 | 0.03 | 0.26 | 0.30 | 2.6 |
| Pecos - Permian Basin | 27.4 | 1.6 | 0.10 | 0.36 | 0.14 | 0.51 | 0.19 | 0.69 |
| Southwest Mountains - Augustine Plains | 1.6 | 26.3 | 0.18 | 11.3 | 0 | 0 | 0.24 | 15.0 |
| Upper Rio Grande Valley | 12.2 | 3.4 | 0 | 0 | 0 | 0 | 0.42 | 3.4 |
| TOTAL | 153.5 | | | | | | | |
| Total (New Mexico only) | 113.3 | | | | | | | |

[a]Emissions in data bank as of June 27, 1974

[b]Interstate

Table A-10. New Mexico Required Emission Reductions, $SO_2$[a]

| SIP | | | | | 1973 Data | | | |
|---|---|---|---|---|---|---|---|---|
| AQCR | AQ Measurement Control Value | Emissions ($10^3$ tons) | Allowable Emissions ($10^3$ tons) | 1975 Estimated Emissions After Controls ($10^3$ tons) | Percent Reduction Required Based On 1973 AQ Data | NEDS Emissions ($10^3$ tons) | Allowable Emissions ($10^3$ tons) | Emission Tolerance ($10^3$ tons) |
| 012 (N.M. portion) | 100.4 | 265.389 | 158.703 | 97.686 | 74 | 1194.0 | 310.4 | -883.6 |
| | | | | | 65 | 247.0 | 86.4 | -160.6 |
| 014 (N.M. portion) | 84 | 73.300 | 73.300 | 27.275 | 90 | 119.4 | 11.9 | -107.5 |
| | | | | | 90 | 113.0 | 11.3 | -101.7 |
| 152 | | | | | b | 4.8 | - | c |
| 153 (N.M. portion) | Texas will bring its non-ferrous smelter into compliance. Region will then be ok. | | | | 28 | 180.0 | 230.4 | 50.4 |
| | | | | | 28 | 1.2 | 1.5 | 0.3 |
| 154 | Ambient air quality well below secondary standards. | | | | b | 0.83 | - | c |
| 155 | " " " " " " " | | | | b | 119.0 | - | c |
| 156 | " " " " " " " | | | | - | 2.7 | - | c |
| 157 | " " " " " " " | | | | b | 0.67 | - | c |

[a]Based on a proportional change of emissions to air quality.

[b]Percent reduction figures were not calculated in these cases because the method used would have called for unrealistic increases in emissions.

[c]Available air quality data indicates that there is a sizeable potential for allowing the emissions of sulfur oxides to increase in this region. However, if this data were used to calculate the tolerance for emissions increase, the results would be unrealistically high.

Table A-11. New Mexico Required Emission Reductions, Particulates[a]

| AQCR | SIP: AQ Measurement Control Value | SIP: Emissions ($10^3$ tons) | SIP: Allowable Emissions ($10^3$ tons) | SIP: 1975 Estimated Emissions After Controls ($10^3$ tons) | 1973 Data: Percent Reduction Required Based On 1973 AQ Data | 1973 Data: NEDS Emissions ($10^3$ tons) | 1973 Data: Allowable Emissions ($10^3$ tons) | Emission Tolerance ($10^3$ tons) |
|---|---|---|---|---|---|---|---|---|
| 012 | - | - | - | - | 62 | 23.3 | 8.8 | -14.5 |
| (N.M. portion) | 171 | 24.262 | 21.107 | 25.212 | 62 | 3.4 | 1.3 | - 2.1 |
| 014 | - | - | - | - | 60 | 37.7 | 15.1 | -22.6 |
| (N.M. portion) | 249 | 125.239 | 72.639 | 42.314 | -60 | 24.6 | 39.4 | 14.8 |
| 152 | 121 | 34.782 | 7.999 | 10.592 | 52 | 25.6 | 12.3 | -13.3 |
| 153 | - | - | - | - | 79 | 14.2 | 3.0 | -11.2 |
| (N.M. portion) | 559 | 29.359 | 7.339 | 28.978 | 68 | 7.0 | 2.2 | - 4.8 |
| 154 | Ambient air quality well below secondary standard | | | | 12 | 11.5 | 10.1 | - 1.4 |
| 155 | " | " | " | " | -47 | 27.4 | 40.3 | 12.9 |
| 156 | " | " | " | " | -32 | 1.6 | 2.1 | 0.5 |
| 157 | " | " | " | " | 46 | 12.2 | 6.6 | - 5.6 |

[a]Based on a proportional change of emissions to air quality.

Table A-12. Fuel Combustion Regulations - New Mexico[a]

| | Existing Sources | New Sources |
|---|---|---|
| Particulates | Smoke - For both existing and new sources, density of smoke is not allowed to be > #1 on Ringelmann scale for period or periods aggregating more than 1 minute in any consecutive 30 minute period. | |
| | Coal - Maximum emission is:<br>0.7 lbs/$10^6$ BTU if hourly heat input is 30 x $10^6$ BTUs or less.<br>0.5 lbs/$10^6$ BTU if hourly heat input is 31 x $10^6$ BTUs or greater | Maximum emission varies from 0.56 to .155 lbs/$10^6$ BTUs as described by the equation<br>$E^* = 0.96135\ I^{-0.23471}$<br>if $I^*$ = 1-1000, and<br>$E = 0.52431\ I^{-0.14687}$<br>if I = 1000 - 20,000 |
| | After December 31, 1974 (for all coal burning equipment) emissions greater than the following are not allowed:<br>0.05 lbs/$10^6$ BTUs<br>0.02 lbs/$10^6$ BTU for Fines (< 2 micron equivalent aerodynamic diameter) | |
| | Oil - Maximum emission is:<br>0.005 lbs/$10^6$ BTU<br>(applies to units having a heat input greater than $10^{12}$ BTU's/yr which is equivalent to 114.15 x $10^6$ BTUs/hr) | |

[a]Applies to stationary fuel burning sources.

*E = maximum allowable emissions of particulate matter and $I^*$ = heat input in $10^6$ BTUs/hr.

Table A-12. Fuel Combustion Regulations - New Mexico[a] (Continued)

| | Existing Sources | New Sources |
|---|---|---|
| $SO_x$ | Maximum emissions is:<br>1 lb/$10^6$ BTU heat input<br><br>For coal burning equipment, limit applies after Dec. 31, 1974, and only to units that have an hourly heat input of more than 250 million BTUs.<br><br>For oil burning equipment, the same $SO_x$ emission limit listed above applies, but only for units that have heat inputs of at least 114.15 million BTUs/hour(equivalent to 1,000,000 million BTUs/year). | Maximum emissions is:<br>0.34 lbs/$10^6$ BTU heat input.<br><br>For coal burners, limit appears to apply as of the day of adoption for the regulation (March 25, 1972).<br><br>For oil, there is no distinction between the limits that apply to existing or to new sources. |

# APPENDIX B

Tables B-1 and B-2 are the assessment of AQCRs which should be examined for the fuel switching impact on particulate and $SO_2$ emissions. They also provide an identification of those AQCRs which show little potential for fuel revision or regulation relaxation if ambient air standards are to be attained.

The general criteria for candidacy is covered by the list of questions found at the beginning of Section 2.0. Some of the more important criteria is reflected by the tables in this appendix. These criteria include (1) the breadth of air quality violations, (2) the fraction of total emissions resulting from fuel combustion, (3) proposed AQMA designations, (4) expected attainment dates, (5) total regional emissions, and (6) regional tolerances for emissions increase.

It should be noted that an AQCR may not necessarily need relaxation of regulations in order to accomplish fuel switching. Further, a good candidate in Tables B-1 and B-2 may later show little potential for fuel switching after individual sources are examined. Finally, it is possible that an AQCR may have air quality levels below standard at present and may require more <u>strict</u> regulations than currently exist if all fuel burning sources were converted to dirtier fuels, i.e., "average" emission rate now may be below "average" regulations.

Table B-1. Candidacy Assessment for Relaxation of Particulate Regulations

| AQCR | Air Quality # Monitors[b] | Air Quality # Violations[c] | Expected Attainment Date | Any Counties AQMA Designations? | % Emission from Fuel Combustion[b] | Tolerance for Emissions Increase[b] ($10^3$ tons) | Overall Regional Evaluation |
|---|---|---|---|---|---|---|---|
| 012 | 10 | 6 | 7/75 | No | 2.7 | -2.1 | Bad |
| 014 | 8 | 0 | 7/75 | No | 83.6 | 14.8 | Bad |
| 152 | 12 | 6 | 7/75 | Yes (1) | 2.9 | -13.3 | Bad |
| 153 | 7 | 3 | 7/77 | Yes (1) | 3.2 | - 4.8 | Bad |
| 154 | 2 | 1 | a | No | 4.9 | - 1.4 | Bad |
| 155 | 8 | 0 | a | No | 1.6 | 12.9 | Good |
| 156 | 1 | 0 | a | No | 26.3 | 0.5 | Good |
| 157 | 9 | 1 | a | Yes (1) | 3.4 | - 5.6 | Bad |

a Presently below secondary standards

[b]Interstate, Figure is for New Mexico portion only.

[c]Of secondary standard (24 hr).

Table B-2. Candidacy Assessment for Relaxation of $SO_2$ Regulations

| AQCR | | 1973 Violations of $SO_2$ Air Quality Standards # monitors (a) | #violations (b) | Expected Attainment Dates Secondary | Any Counties With AQMA $SO_2$ Designations ? | % Emission[b] from Fuel Combustion | 1973[b] Tolerance for Emissions Increase ($10^3$ tons) | Overall Regional Evaluation |
|---|---|---|---|---|---|---|---|---|
| Ariz.-N.M. So. Border | 012 | 10 | 1 | 7/75[c] | no | 0.04 | -160.6 | bad candidate |
| Four Corners | 014 | 7 | 0 | 7/77 | no | 95.2 | e | bad candidate |
| Albuquerque-Mid Rio Grande | 152 | 1 | 0 | d | no | 24.0 | e | good candidate |
| El Paso-L.Cruces Alamogordo | 153 | 5 | 0 | 7/75 | no | 35.7 | 0.3 | good candidate |
| Northeastern Plain | 154 | 1 | 0 | d | no | 22.9 | e | good candidate |
| Pecos-Permian Basin | 155 | 2 | 0 | d | no | 6.3 | e | " " |
| S.W. Mtns-Augustina Plains | 156 | - | 0 | d | no | 2.2 | e | " " |
| Upper Rio Grande Valley | 157 | 2 | 0 | d | no | 91.0 | e | " " |

Notes: a. # of bubblers only
b. for interstate AQCRs, listing given is only for portion in New Mexico
c. 18 month extention granted to submit a plan. The 7/75 attainment date refers to the primary standard only.
d. ambient standards presently below secondary standards
e. Available air quality data indicates that there is a significant potential for allowing the emissions of sulfur oxides to increase in this region. However, if this data were to be used to calculate the tolerances for emissions increase, the result would be unrealistically high.

# APPENDIX C

This appendix provides a characterization of individual power plants by AQCR. Current power plant information used to prepare Table C-1 was obtained from three main sources: (1) Federal Power Commission computerized listings of power plants and their associated fuel use, (2) the National Coal Association's Steam-Power Plant Factors, listing of power plants and fuel use in 1972, and (3) emission data in the NEDS data bank as of June 29, 1974. Fuel schedules for 1973 were extracted from the FPC data (1 above), and this was used in conjunction with NEDS emission data to estimate 1973 emissions for each of the sources. When 1973 fuel schedules were not available, 1972 schedules were used as extracted from Steam-Power Plant Factors. $SO_2$ and particulates emissions are those associated with the fuel shown. When actual emissions were not listed in NEDS, AP-42 emission factors were used to estimate $SO_2$ and particulate emissions, based on fuel schedules.

After the name of each plant is a listing of the fuels for which the plant was designed (from source 2). For the purposes here, it is assumed that when a plant is shown to have dual fuel capability, it is able to use entirely one fuel or the other.

Also shown is the 1975 regulations which are currently applicable to the given plant, taken from Table A-12. (Particulate limits are assumed to be based on the entire heat input of the plant.)

It might be cautioned that AQCR total emissions calculated in the tables of Appendix C (and also Appendix D) may not agree exactly with total emissions represented in Appendix A (Tables A-8 and A-9). This is a result of both differing fuel schedules in 1973 compared to previous years and the relative "completeness" of the NEDS data bank.

Table C-1. New Mexico Power Plant Assessment

| AQCR | Plant Capacity | Fuel Use: Type, % Sulfur, % Ash | Fuel Use: Annual[b] Quantity | Heat Input ($10^6$ BTU/hr) | Emissions (tons/year): $SO_2$ | Emissions (tons/year): Particulates | Emissions ($lbs/10^6$ BTU): $SO_2$ | Emissions ($lbs/10^6$ BTU): Particulates | 1975 Emission Limit ($lbs/10^6$ BTU): $SO_2$ | 1975 Emission Limit ($lbs/10^6$ BTU): Particulates |
|---|---|---|---|---|---|---|---|---|---|---|
| 12 | Community Pub.Ser.. | Gas | 2224 | 279** | 0.67 | 17 | < .01 | 0.01 | None applicable | |
| 14 | Ariz Pub. Ser. Four Corners | Coal 0.70%S 22.0%A | 3,057,689 | 5924 | 146,614 | 33,655 | 5.64 | 1.29 | Regulations for this plant has 1977 compliance date | |
| 14 | Farmington | Gas | 1320 | 169 | 0.40 | 10 | < .01 | 0.01 | None applicable | |
| 152 | Pub.Serv. of N.M. Person | Oil 0.75%S | 3,775 | 61.2 | 222 | 14.9 | 0.83 | 0.06 | " | " |
| | | Gas | 4,418 | 553 | 1.33 | 33.1 | < .01 | 0.01 | " | " |
| 152 | Pub.Serv. of N.M Reeves | Oil 1.25% | 7,034 | 121 | 690 | 27 | 1.3 | 0.05 | 1.00 | .005 |
| | | Gas | 11,151 | 1,400 | 3.3 | 83.6 | < .01 | 0.01 | None applicable | |
| 152 | Plains Elec.Gen. and Trans. | Oil 2.0%S | 203 | 3.50 | 33 | 2.3 | 2.15 | 0.15 | " | " |
| | | Gas | 764 | 97.7 | 0.23 | 5.7 | < .01 | 0.01 | " | " |

*Emissions calculated using AP-42 factors.
**Used on estimated 1100 BTU/SCF in calculation.

[b]Units used for fuels - gas, $10^6$ cubic feet; oil, $10^3$ gallons; and coal, tons.

Table C-1. New Mexico Power Plant Assessment (Continued)

| AQCR | Industry | Fuel Use: Type, % Sulfur, % Ash | Fuel Use: Annual[b] Quantity | Heat Input ($10^6$ BTU/hr) | Emissions (tons/year): $SO_2$ | Emissions (tons/year): Particulates | Emissions ($lbs/10^6$ BTU): $SO_2$ | Emissions ($lbs/10^6$ BTU): Particulates | 1975 Emission Limit ($lbs/10^6$ BTU): $SO_2$ | 1975 Emission Limit ($lbs/10^6$ BTU): Particulates |
|---|---|---|---|---|---|---|---|---|---|---|
| 153 | El Paso Elec Co. | Oil 3.70 %S | 63 | 1.03 | 18.3* | 0.25* | 4.06 | 0.06 | None applicable | |
| | | Oil | 4,271 | 73.6 | 325.2* | 17.1* | 1.01 | 0.05 | " | " |
| | | 0.97%S Gas | 9,765 | 1,188 | 2.9* | 73.2* | < .01 | 0.01 | " | " |
| 154 | Raton Pub.Serv. | Coal 0.40%S 19.0%A | 18,857 | 51.7 | 144 | 246 | 0.64 | 1.09 | None | 0.5 |
| 155 | S.W.Public Serv. Roswell | Oil | 218 | 3.3 | 10 | 1 | 0.69 | 0.07 | None applicable | |
| | | 0.72%S Gas | 1,249 | 143 | 0.37* | 9.37* | < .01 | 0.01 | " | " |
| 155 | S.W.Public Serv. Carlsbad | Oil | 818 | 13.0 | 91 | 4 | 1.60 | 0.07 | " | " |
| | | 1.40%S Gas | 1,880 | 215 | 0.56* | 14.1* | < .01 | 0.01 | " | " |
| 155 | Lea Co.Elec | Gas | 3,117 | 396 | 1 | 23 | < .01 | 0.01 | " | " |
| 155 | N.M.Elec Serv. | Gas | 5,385 | 669 | 2 | 40 | < .01 | 0.01 | " | " |
| 155 | S.W. Pub.Serv. | Gas | 1,427 | 163 | 0.43* | 11 | < .01 | 0.02 | " | " |

*Emissions calculated using AP-42 factors.

[b]Units used for fuels - gas, $10^6$ cubic feet; oil, $10^3$ gallons; and coal, tons.

# APPENDIX D

The Table D-1 in this appendix lists individual industrial/commercial/ institutional sources of particulates and $SO_2$ emissions which might show fuel switching potential. The sources are from a NEDS rank order emissions listing.

It should be cautioned that the percent emissions accounted for is different than the "% of fuel use accounted for," It is possible that several potential fuel switch sources could be overlooked by the cutoff point on the emissions (i.e., a reasonable sized natural gas used may emit below our cutoff point in the NEDS rank order list).

No information was available for feasibility of <u>any</u> fuel switching.

Table D-1. New Mexico Plant Assessment

| AQCR | Plant Capacity | Type % Sulfur % Ash | Annual[b] Quantity | Heat Input ($10^6$ BTU/hr) | Emissions (tons/year) $SO_2$ | Emissions (tons/year) Particulates | Emissions (lbs/$10^6$ BTU) $SO_2$ | Emissions (lbs/$10^6$ BTU) Particulates | 1975 Emission Limit (lbs/$10^6$ BTU) $SO^2$ | 1975 Emission Limit (lbs/$10^6$ BTU) Particulates |
|---|---|---|---|---|---|---|---|---|---|---|
| 155 | Nat. Potash Co. | Gas | 339 | 38.7[A] | 0.1* | 3 | < .01 | 0.02 | None applicable | |
| 155 | Int. Mine & Chem. | Gas | 1335 | 152 | 0.4* | 12 | < .01 | 0.02 | " | " |
| 155 | El Paso N. Gas | Gas** | 364 | 44.5 | 0.1* | 3 | < .01 | 0.02 | " | " |

A-Estm. 1000 BTU/SCF in calculation

*Emissions calculated using AP-42 factors

**Gas Turbine

[b]Units used for fuels - gas, $10^6$ cubic feet; oil, $10^3$ gallons; and coal, tons.

## Table D-1. New Mexico Plant Assessment

| AQCR | Plant Capacity | Type<br>% Sulfur<br>% Ash | Annual[b] Quantity | Heat Input ($10^6$ BTU/hr) | Emissions (tons/year) $SO_2$ | Emissions (tons/year) Particulates | Emissions (lbs/$10^6$ BTU) $SO_2$ | Emissions (lbs/$10^6$ BTU) Particulates | 1975 Emission Limit (lbs/$10^6$ BTU) $SO^2$ | 1975 Emission Limit (lbs/$10^6$ BTU) Particulates |
|---|---|---|---|---|---|---|---|---|---|---|
| 12 | Kennecott | Oil<br>1.30%S | 917 | 10.5[AA] | 81 | 7 | 1.76 | 0.15 | None applicable | |
| | | Gas | 2642 | 302 | 0.79[A] | 23.8[A] | <.01 | 0.02 | " | " |
| 153 | El Paso N. Gas | Gas[AAA] | 463 | 56.7 | 0.14 | 4[AA] | <.01 | 0.02 | " | " |

[A]Estm. $10^5$ Btu/gal in calculation

[AA]Emissions calculated using AP-42 factors

[AAA]Gas Turbine

[b]Units used for fuels - gas, $10^6$ cubic feet; oil, $10^3$ gallons; and coal, tons.